



## Apoptosis induced by Oropouche virus infection in HeLa cells is dependent on virus protein expression

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**Year:** 2010  
**Journal:** Virus Research. 149 (1): 56-63

### Abstract:

Oropouche (OROV) is a single-stranded RNA arbovirus of the family Bunyaviridae, genus Orthobunyavirus, which has caused over half a million cases of febrile illness in Brazil in the past 30 years. OROV fever has been registered almost exclusively in the Amazon region, but global warming, deforestation and redistribution of vectors and animal reservoirs increases the risk of Oropouche virus emergence in other areas. OROV causes a cytolytic infection in cultured cells with characteristic cytopathic effect 48h post-infection. We have studied the mechanisms of apoptosis induced by OROV in HeLa cells and found that OROV causes DNA fragmentation detectable by gel electrophoresis and by flow cytometric analysis of the Sub-G1 population at 36h post-infection. Mitochondrial release of cytochrome C and activation of caspases 9 and 3 were also detected by western blot analysis. Lack of apoptosis induced by UV-inactivated OROV reveals that virus-receptor binding is not sufficient to induce cell death. Results obtained in cells treated with chloroquine and cycloheximide indicated that viral uncoating and replication are required for apoptosis induction by OROV. Furthermore, treatment of the cells with pan-caspase inhibitor prevented OROV-induced apoptosis without affecting virus progeny production. The results show that OROV infection in vitro causes apoptosis by an intracellular pathway involving mitochondria, and activated by a mechanism dependent on viral replication and protein synthesis.

**Source:** <http://dx.doi.org/10.1016/j.virusres.2009.12.013>

### Resource Description

#### Exposure :

weather or climate related pathway by which climate change affects health

Ecosystem Changes

#### Geographic Feature:

resource focuses on specific type of geography

Tropical

#### Geographic Location:

resource focuses on specific location

# Climate Change and Human Health Literature Portal

Non-United States

**Non-United States:** Central/South America

**Health Impact:** ☒

specification of health effect or disease related to climate change exposure

Infectious Disease

**Infectious Disease:** Zoonotic Disease

**Zoonotic Disease:** Other Zoonotic Disease

**Zoonotic Disease (other):** Oropouche virus

**Resource Type:** ☒

format or standard characteristic of resource

Research Article

**Timescale:** ☒

time period studied

Time Scale Unspecified